NOTES

ON SOME of the COMMON MINERALS TO BE FOUND IN LABRADOR AND NEWFOUNDLAND.

For the Use of Fishermen and Liviers
More Particularly in Labrador.

By

J. M. MOUBRAY,

Associate of the Institute of Mining and Metallurgy: Member of the American Institute of Mining Engineers: Fellow of the Royal Geographical Society. &c.. &c.

J. M. MOUBRAY & CO.
Mining Engineers, Mineral Analysts and Assayers.
ASSAY OFFICE: LAW CHAMBERS, ST. JOHN'S.
Head Office: London, England.

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by

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INDEX.

I have often been told by fishermen and liviers on the Labrador and Newfoundland coasts that when travelling through the country they sometimes meet with different kinds of minerals, but not knowing whether these are of any value they take no further notice of the matter.

It is with a view of indicating in a slight degree what some of the common minerals of value look like, and how they are found, that these brief notes have been written.

Who knows but that valuable mineral deposits are being passed over daily on the coasts, as was the case until recently at Bell Isle? A very slight technical knowledge coupled with the faculty of observation is all that is required to notice a mineral a little different from the common rocks which make up the land. A sample of this sent to the expert will soon determine whether it is of value or otherwise.

J. M. MOUBRAY.

St. John's, Nov. 1910.

HOW TO TAKE A SAMPLE.

When a mineral sample is taken, the size of the deposit should always be noted. If the mineral is found in a vein, then note how wide the vein is, and for what distance it can be seen or traced on the surface.

Should the mineral be found in say a vein of quartz 20 feet wide and be in itself in patches only a few inches square, it is not correct to take a sample from the patches of mineral only, and to say the vein is 20 feet wide; this leads one to expect a vein "of mineral" 20 feet wide, which is obviously not the case.

Should a seam of mineral 3 feet wide be found in which one foot is nearly solid mineral and the other two feet mixed mineral rock; if a sample is to be taken of this "vein" or "seam" the mixed material must be sent as well as the solid mineral, the same weight as nearly as possible for every inch or foot of the width of the seam. No one would eat all the plums and leave the duff, then saying they had eaten the pudding; and yet this is exactly what happens when the mineral only is picked out. It is often forgotten that should the mine come to be worked the poor vein stuff will have to be mined and shipped as well as the rich. Three or four pieces a few inches square make a poor sample; it is just as easy to take a decent sample three or four pounds in weight.

HOW TO FIND OUT THE CONTENTS AND VALUE OF A MINERAL SAMPLE.

The fact does not seem to be generally known that the Department of Agriculture and Mines at St. John's will, on receipt of a mineral sample from a fisherman, have it assayed or tested free of charge.

An analysis or assay of a mineral sample can be ob-

tained at the owner's cost by sending it direct to Messrs. J. M. Moubray & Co., Assay Office, St. John's. The following is the scale of charges:—

ASSAY FEES.

(Ores and Metals.)

Gold and Silver in one Sample	$3.50
Gold	3.00
Copper	2.50
Iron	2.50
Lead	2.50
Silver	2.50
Sulphur	4.00
Zinc	4.00
Manganese	4.00
Graphite	4.00
Chrome	5.00

Quantitative Analysis of Minerals from $12, price varying according to number of substances in sample.

Qualitative Analysis, $5.00 to $15.00.

Blowpipe Analysis of Mineral Samples, 50c.

Identification of Mineral Samples, 25c.

Prices not mentioned in the foregoing list may be had on application.

An extra charge is made for crushing Samples over 7 lbs. in weight.

N.B.—All Assay Fees are Payable on Deposit of Samples.

MICA.

This has probably been more sought for on the Labrador coast than any other mineral.

Mica is often found in veins which are made up of quartz and felspar, quartz being a hard white or glassy mineral that will scratch steel. There are several kinds of mica, but only the white and black varieties need be considered here. White mica is the most valuable, but a ready market also exists for that darker in colour or even black.

Mica to be of value must be clear of all blemish and specks, hard and flexible: provided it possesses these qualities, it is worth from a few cents a pound for pieces two by three inches in size, up to a dollar or more, as the size increases. A vein that only shows a few pieces will probably not increase in its mica contents as it goes down. This has been amply proved on the Labrador, as at Chateau, Cape Charles, Square Island, White Bear Arm, Boulter's Rock, Black Island, Hamilton Inlet and other places where prospecting work has been done for mica; but although some excellent samples have been obtained, no payable proportion has as yet been located. Mica is worked in Canada, but a large proportion of the world's supply is obtained from India.

FELSPAR,

Sometimes spelt feldspar. There are many varieties of this mineral, but only two are worth notice from a commercial point of view, and those are Labradorite and Orthoclase.

ORTHOCLASE

Is found in veins often in association with Mica. It is generally of a reddish white, red or flesh colour, and has a vitreous or greasy look when broken and held in certain lights.

Felspar rock made up of a very large percentage of this mineral is sometimes found in large bodies, such as at Red Bay, Straits of Belle Isle.

To be of value the mineral must be fairly pure and in considerable quantity, such as a vein 15 or 20 feet wide and several hundred feet in length.

Good examples of Orthoclase Felspar can be seen in many places on the Labrador.

Orthoclase contains over 16 per cent. of potash, and it is from the decomposition of rocks containing this mineral that plants and trees obtain their supplies of potash, enabling them to grow.

LABRADORITE

Is found in bulk on the Northern Labrador. It is of a grey, green or brown color, and when held in certain positions exhibits a fine play of blue and green colours. Small quantities of Labradorite are used for the making of little ornaments, and there is an uncertain market for it as an ornamental building stone, but is only of value for this use when in demand, which is not often.

GARNET.

There are many kinds of Garnets, all of which are hard and will scratch glass and are fairly heavy. Those found in Labrador are mostly of a reddish brown or deep

red colour and are found scattered throughout different rocks like raisins in a pudding.

Garnets are more often found in such rocks as schist or gneiss, which have undergone considerable alteration since their formation, but sometimes in veins of quartz and felspar, in which case they are as a rule only in small quantity.

Garnets are found from the size of small shot to that of hens' eggs. A good example of small garnets scattered through an altered rock is to be seen in some of the rocks to the southeast of the burying ground at Chateau. Garnets of a larger size are to be found in other places on Labrador.

A deposit to be of value should contain a large percentage of Garnet and should be of considerable extent, as the material when separated is sold by the ton.

Good clear stones are of value for use in jewellery, but are not often found.

In bulk, Garnet is used for the making of emery wheels and cloth, and if of good quality will find a ready market.

BARYTES

Is often found in veins. It is generally white in color, but sometimes has a red, brown or yellow tinge. Barytes is a very heavy mineral, which has a greasy look and can be easily scratched with a knife. It must not be mistaken for calcite or crystalline limestone, which is not heavier than ordinary rock, but in many other respects is somewhat like Barytes.

The chief use to which this mineral is put is as an adulterant for white lead paint—to find a ready market it must be of a good white color.

GRAPHITE OR PLUMBAGO

Is found in bed or vein form, and if examined closely, except when in granular form, it is seen to be made up of a number of thin layers. The mineral is of a shining iron black colour, can be easily cut with a knife, and will mark paper like a pencil.

The largest supplies come from Ceylon, although it has been found on Labrador. The price of pure graphite ranges from 2c. to 10c. per lb., according to quality.

MOLYBDENITE.

A much rarer and more valuable mineral, is very like graphite in many respects; it is, however, fairly heavy.

ASBESTOS.

This mineral is always found in serpentine rocks. It is of a fibrous nature and can be picked apart with the fingers. If beaten out with a hammer it becomes like wool. In color Asbestos varies from white to greenish brown, and is generally found in the form of small veins, often running in all directions through the rock. Unless the fibre is over an inch in length the mineral is of no great value, and to be worth working it must be found in considerable quantity.

ANTIMONY.

This metal is commonly found as the mineral antimonite. It occurrs in veins in massive form, having a columnar structure, and is of a lead grey colour and very heavy. Antomonite can be cut with a knife. If solid and found in vein form it would be payable if the width exceeded about a foot and the vein was of some extent.

LEAD.

The metal lead is obtained from a number of ores, but the only one that need be considered here is Galena or Sulphide of Lead.

Galena is almost always found in veins or pockets, and if closely examined it will be seen to be made up of a number of small pieces or crystals, each of these having square sides. It is lead grey in colour, very heavy, and generally shows a bright surface.

Galena often contains very considerable quantities of silver, and sometimes gold, rendering it very valuable.

It is often found in veins as small grains and lumps in association with copper or zinc ores, and also as pockets in limestone rock.

MANGANESE.

The ores of this metal are generally steel grey to iron black in colour. A little Manganese ore will often stain the surrounding rock for a considerable distance, giving the appearance of a large body of ore, when in reality the vein is quite small. The true nature of the rock can easily be ascertained by breaking it, and if it is only a stain of Manganese, the different colour of the rock will be seen at the break.

Manganese ore is heavy and hard, so that it cannot be easily scratched with a knife. It is used in the manufacture of steel and is worth considerably more than iron ore.

CHROMITE,

Or Chrome Iron Ore, is found almost always in serpentine rocks. It is very heavy and hard, and often when not

massive is made up of a number of little granules like sandstone.

It is of considerable value and is used for making bricks for furnace lining, steel alloys, etc.

IRON.

There are several important ores from which this metal is obtained. Iron ores of all kinds are generally indicated by a red or rusty colour on the surface or surrounding rocks; in fact so closely is iron in some form or another associated with many minerals that if the soil appears specially rusty in any one place it is often worth further examination, as it may be the result of the decomposition of the cap of an ore body or lode.

HAEMATITE IRON ORE.

Is found in two varieties. It is widely scattered throughout many rocks and can be looked for as veins, beds or pockets.

Red Haematite Ore is heavy and will mark other rocks red—this is the ore which is mined at Bell Isle in Conception Bay.

Crystalline Haematite or Specular Iron Ore is of exactly the same composition as Red Haematite, but made up of a number of small shining particles of mineral which sparkle in the sun. It shows a red streak when scratched.

MAGNETIC IRON ORE.

This is the richest kind of Iron Ore, containing, when pure, over 80 per cent. of iron. It can always be detected, as when held near a compass the needle is at once deflected.

Magnetite is iron black in color, heavy and very hard

It is found in small grains scattered throughout many of the rocks along the Labrador coast; it also occurs in veins and masses.

ILMENITE.

Or Titanic Iron Ore, is almost the same in appearance as Magnetite, the difference being that it contains some titanium, which substance greatly lessens the value of the ore. Ilmenite is only slightly magnetic, if at all. It is found along with the Magnetite scattered through many of the Labrador rocks as small grains.

BLACK SAND.

On most of the sandy beaches in Labrador on examination the sand is seen to contain a quantity of "Black Sand." This is often concentrated by the action of the water and can be found in small patches nearly pure. If picked up it will be found to be much heavier than the common sand.

Black sand is simply the Magnetic and Ilmenite which has been liberated from the rocks by the decomposition of their softer constituents and has been washed down to the sea by the streams and rivers where it has accumulated on the beach.

If found in a very large quantity it might be worked at a profit, especially if there is any water power in the vicinity.

BOG IRON ORE

Is simply what the name indicates—iron ore found in bogs. It is of a porous earthy brown nature, and in many countries is mined in large quantities.

IRON PYRITES OR MUNDIC.

This mineral is a combination of iron and sulphur. If

struck with a piece of steel or hammer a smell of sulphur is at once noticed.

Iron Pyrites was worked for some time at Pilley's Island mine, Notre Dame Bay. It is found in small grains in many rocks, and is known to occur in large masses in Northern Labrador.

Iron Pyrites is of a pale brass yellow colour, heavy and hard, so that it cannot be scratched with a knife To be of the best quality it should be free from arsenic. It has a ready sale, being used to generate sulphurous fumes and the cinder then utilized as an iron ore.

COPPER.

After Iron, Copper is perhaps the most useful of metals. It is found as a great variety of minerals, but a deposit of any of its ores is almost invariably indicated by green stains on the surrounding rocks at surface. This is due to the decomposition of the copper ore and the formation of carbonate of copper.

When this green stain is found in quantity it is known as the mineral malachite.

Only three of the most important sulphide ores will be described here. Copper is sometimes found as the metal in its native state.

COPPER PYRITES, OR YELLOW COPPER ORE.

This is the most common form of copper ore. It is of a brass yellow colour and can be scratched with a knife, being only fairly hard and fairly heavy. It is found in almost all kinds of deposits, as large masses, veins, lodes and in pockets in nearly every kind of rock. As a copper mine becomes deeper, no matter what kind of ore was

found near the surface, it nearly always gradually turns into Copper Pyrites.

Copper Pyrites contains about 30 per cent. of copper.

BORNITE, OR PEACOCK COPPER ORE.

This mineral is so named from the variety of colours it exhibits. On breaking it has a greyish black colour which soon tarnishes to a copperish red, or the colours in a peacock's tail. It can be cut fairly easily with a knife. is heavy and contains about 60 per cent. copper.

GREY COPPER ORE.

This is one of the richest ores of copper and often contains silver and gold. It is of a blackish lead grey colour, often with a bluish tarnish. Grey Copper Ore is very heavy and can be easily cut with a knife. It is generally found in veins, and when pure contains nearly 80 per cent. of copper.

GOLD.

This metal has been found in not a few places on the Labrador coast, but as yet in only small quantities.

It originates usually from quartz veins.

Gold can often be seen in small specks or spangles in the quartz, and if so visible the ore is of considerable value. Many gold ores, in which the gold is free but not visible, are however payable.

As the rocks are decomposed by the action of the weather and the debris is washed down by rivers and streams so is the gold; but as the metal is not decomposed by the action of the weather it remains as it left the rocks, except that the particles become rounded by the gradual friction against rock particles.

When the gold is washed out of the sand or ground in

a prospector's pan, by examining the partcles with a magnifying glass it is sometimes possible to tell whether they have travelled a long distance or not, accordingly as they are very much rounded or have sharp angles or corners.

Alluvial sands or gravels, which have been brought down at some time or other by rivers which may by now be completely dried up or have shifted their courses by many miles, often contain gold in payable quantity. It is in this form that gold is found in the Klondyke.

SILVER.

This metal is easily recognized in its native state, as it is the colour of a silver coin, mallable, and can be cut with a knife. It is often blackened a little on the outside when found.

Native silver has been found in veins in parts of Canada.

There are several ores of silver which are all heavy and soft, but by no means common. Silver has been previously mentioned as being often carried in Galena and Grey Copper Ore.

OIL SHALE.

This rock is found in several parts of Newfoundland, more particularly on the northwest coast. It is of a blackish or brownish colour, and sometimes owing to the action of the weather splits up into a number of thin sheets like leaves of a book, only thicker. It is often, however, of a more solid nature and contains small concretions or lumps of a harder shale. Oil Shale can always be identified by being broken up into small pieces and heated to redness on a small tin or can over a fire, when a smell of petroleum or kerosene oil will be given off.

In many instances the petroleum still remains in the rock in a solid form, but in others it has separated out

from the shale with the result that it sometimes oozes out of the rock on a warm day. It is with the hope of striking an accumulation underground of such oil that wells are drilled.

SOME COMMON ROCKS AND THE MINERALS OFTEN FOUND IN ASSOCIATION WITH THEM.

Rock.	Mineral.
Serpentine.	Asbestos, Chromite, large masses of Pyritic Iron and Copper Ore.
Slates and Rocks of Slaty Nature.	Copper, Graphite, Iron, Barytes, Oil Shale, Veins of Quartz.
Granite.	Veins of Quartz, Felspar and Mica.
Limestone.	Pockets of Lead, Copper and Iron Ore.
Altered, Igneous and Volcanic Rocks.	Veins of Quartz, Dyke's Carrying Minerals of all kinds